



ALA Office for Information Technology Policy



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## Regional Library Cooperatives and the Future of Broadband

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## SETTING THE SCENE

In January 2007, the American Library Association's (ALA's) Office for Information Technology Policy (OITP) undertook a Public Library (Internet) Connectivity Project, funded by the Bill & Melinda Gates Foundation. The Connectivity Study Team visited seven states and conducted telephone interviews with six additional states. The process included holding focus groups and interviews with staff from state library agencies and existing library telecommunication networks, state E-rate coordinators, state economic development officials, telecommunication industry representatives, state legislative representatives, and practitioners from the library community.

The study identified Regional Library Cooperatives (RLCs) as one of the key players in enhancing high-speed broadband in libraries. Through collaboration, some small- and medium-sized libraries were able to pool their resources to better manage technology infrastructure, including improved administrative and technical expertise. This included assistance in applying for E-rate funding.

As a result of these findings, OITP organized an invitational meeting for selected RLCs that provide broadband services, in order to develop a model or models of how these cooperatives organized, implemented, and operated these services. The meeting also identified the most critical challenges faced by the RLCs and began a process for the development of mechanisms to share best practices. The purposes of the meeting were as follows:

- Articulation of the role of RLCs in facilitating and supporting the deployment of broadband to member libraries;
- Articulation of a model that could be shared with other RLCs;
- Identification of factors that lead to successful deployment of broadband telecommunications in an RLC;
- Creation of a network of RLCs to facilitate communication;
- Discussion of how to encourage other RLCs to deploy and support high-speed broadband; and
- Planning a conference that may be held prior to ALA's 2008 Annual Conference in Anaheim, California, to which all RLCs will be invited.

The meeting was held in Denver, Colorado, on December 11-12, 2007, with 20 participants (including administrators and IT managers) representing 13 RLCs and OITP staff and consultants (see the Appendix). John Windhausen Jr., president of Telepoly Consulting and a member of the Connectivity Study Team, set the stage with his keynote address, "An Overview of U.S. Broadband Deployment and Policy and Library Internet and Broadband Issues." Nancy Bolt and Linda Crowe facilitated the meeting and drafted this summary. This meeting was supported by a grant from the Bill & Melinda Gates Foundation and funds from the ALA Office for Information Technology Policy.

The remainder of the meeting was participant-driven, focusing on 24 questions developed around three main areas:

- **Model Building:** Is there a model of RLC activity in broadband deployment that could be articulated and shared?
- **Challenges:** What challenges do RLCs face in broadband deployment and use in libraries, now and in the future?
- **Knowledge and Experience Transfer:** How can experience and knowledge be shared with other RLCs, which might be encouraged to assist in broadband deployment?

The bulk of this report focuses on these issues and the experiences and strategies employed by RLC staff to recognize, manage, and meet the increasing infrastructure needs of their member libraries.

## SERVICES AND A MODEL

A major purpose of the meeting was to seek out a model that could be developed, which might be implemented by other RLCs. The model would identify common factors in the decision to facilitate high-speed broadband service or in other services offered, which could serve as guidance or encouragement to other RLCs that might in turn consider offering high-speed broadband service.

### **Services Offered by RLCs**

The discussion began with an articulation of services in the area of high-speed broadband deployment that are currently being offered by the RLCs.

#### *A general advisory role*

The RLCs at the meeting indicated that they play a multifaceted role, which includes advising local libraries about their needs and also providing services directly to the local libraries. The RLCs also provide advocacy and educational support for librarians and their boards and committees. RLCs frequently push libraries to try new technologies and broaden their perspective and knowledge base, often by demonstrating the value of technology and broadband connectivity. In some communities, the library was the first (and may still be the only) Internet connectivity available at no direct cost to patrons.

The RLCs regularly balance access and costs between larger and smaller libraries. The general support was described as “handholding” for librarians who need reassurance that they are capable of troubleshooting connectivity problems. One RLC staffer described it thusly: “A lot of libraries do their own thing, they encounter roadblocks, we help them.” Most of the RLCs had also developed user agreements and minimum standards, again to maintain consistent quality service.

All of the RLCs described what they do as “member-driven,” designing services to meet the needs and expressed direction of their members. Most RLCs have member advisory committees, and regular meetings of members allow them to express their opinions to RLC staff.

When asked what member libraries would do without their services, most of the RLCs agreed that the libraries would not have as robust broadband connectivity, staff with knowledge to address broadband issues, nor as stable and secure funding. The RLCs strongly felt that the most valuable service they offered was knowledgeable staff.

### *Aggregation*

The RLCs indicated that the broadband services often grew out of a shared integrated library system (ILS). (Many shared ILSs pre-dated the availability of the Internet for general public use in the mid-1990s.) The requisite telecommunications network, which was already in place to support the shared ILS, made it easier to support the request for additional services, such as the initiation and support of high-speed broadband and Internet services.

The aggregation also resulted from a realization that member libraries working together could provide coordinated communication and the influence needed to negotiate lower prices. Some RLCs issue a request for proposal (RFP) and negotiate the contracts on behalf of their members for the best available broadband service.

The benefits of aggregated purchasing extend to hardware and software; it ensures that the network is supported by uniform equipment of consistent quality.

In some instances, aggregating demand demonstrates to telecommunications providers that it is worthwhile to deploy broadband to libraries. Some RLCs then “postalize” rates, such that every library pays the same rate or is subject to the same categories of rates. This allows more geographically isolated areas to receive service at an affordable rate. Sometimes, one provider responds to an RFP and gets a contract, sometimes it is a coalition of providers that serves the entire state. But the demand is always aggregated at a regional or state level.

### *Management and planning*

The RLCs provide network management for member libraries. This includes monitoring traffic on their networks and either directly upgrading the network or advising the local library on how to more efficiently use its bandwidth.

In addition, RLCs have designed networks that connect member libraries or negotiated with a telecommunications provider to design the network, which often includes a variety of telecommunication standards and delivery mediums, such as Wi-Fi, DSL, and fiber.

### *Equipment, technical support, troubleshooting and training*

All the RLCs either provided direct technical support or local technical training. This often results in a technology triage by which local librarians do basic troubleshooting and the RLC addresses the more difficult problems. Many RLCs specified, purchased, inspected, installed, and maintained equipment for members. One service was the provision of back-up or replacement equipment for use in emergencies to maintain a high degree of network availability. One RLC has mobile Internet labs, which a member library can request to offer services to the public, for example, filing income taxes online.



## FUTURE BANDWIDTH NEEDS

The RLCs all agreed that the need for bandwidth is exploding. In addition to the bandwidth demand of the shared ILS, generally increased Internet access, and Web 2.0, the RLCs are also asked to assist with or provide access to:

- Online databases;
- Digitization;
- Internet filters that help libraries comply with the Children's Internet Protection Act (CIPA);
- Gaming;
- Audio/video downloads;
- Shared cataloging;
- Training; and
- Wireless.

One RLC staffer felt that "libraries are 10 years behind in technology adoption. For example, libraries should be on cell phones and allow patrons to renew items by text message."

## FACTORS RESULTING IN SUCCESS

A primary purpose of the model building was to identify the key factors that resulted in the RLC planning, acquiring, and supporting high-speed broadband for its member libraries. RLCs were asked to consider a Collaboration Planning Process Model that had been developed in the *Public Library Connectivity Project*, based on discussions with statewide networks. The RLCs indicated that there was commonality between the development of high-speed broadband services within their regions and the statewide networks.

### *Leadership*

At the state or regional level, an individual or a group of people took the lead. Often the impetus was the implementation of an ILS for resource-sharing among member libraries. Occasionally, the state library or a state network offered the chance to participate in an automated network. In all cases, someone at the regional level saw this as an opportunity and took a leadership role.

### *Vision*

One common factor among all the participants was a vision about the benefits of libraries working cooperatively that came from the regional staff or its board or committees working with member libraries. The vision also grew in response to member opinions and demand, augmented by staff who shared possibilities for growth of the network. In some states, leadership began at the state library and was adopted by the RLC. One RLC described the beginning of its service as "due to desperation, nothing else. We were fed up with community libraries having only dial-up. We pushed; it is what small libraries need and we must do."

Another said, “When the first Gates [Foundation] grants were made, local governments were not in position to help libraries get the required connectivity for the Gates computers. Nor did local governments have technical ability or the mindset to help the libraries. Our regional was the best vehicle to help the local libraries; we were ahead of the curve. We had the willingness, which led to expertise.”

#### *Inclusivity and partnerships*

At the regional level, inclusivity was based on members and serving their needs. All had boards or committees representing member needs, which made decisions about new or expanded services. Some RLCs had technical advisory committees that assisted regional staff in their decision-making process.

#### *Advocacy for the role of libraries*

All of the RLCs saw one of their roles as advocating on behalf of the members for network development and new services. They also represented their member libraries’ needs at the regional and state level. Some were able to lobby legislators directly and others offered information in support of funding for library connectivity, working in conjunction with state library efforts.

#### *Demonstration models*

At the regional level, emphasis was placed on demonstrations and models of new technology and network services. One RLC staffer said they “had a good idea and just started doing it,” as a way to demonstrate the value of the service to its members.

#### *Aggregation of demand and services*

At all levels, the benefits of aggregation were a prime motivator for collaboration. Aggregation resulted in lower costs for members and greater value from telecommunication and Internet service providers.

The OITP interviews from the Public Library Connectivity Project demonstrated that collaboration often results in:

- Joint planning;
- Building a business case for broadband providers to deploy broadband;
- More affordable pricing;
- Sharing costs;
- Better support and maintenance; and
- Shared services.

#### *Technical plan for implementation and support*

One service offered in all RLCs was technical planning and support from regional staff in order to implement the plan. Staff developed technical plans that addressed current connectivity problems and provided direction for the future. They also trained local library staff to handle technical problems and provide ongoing support.

### *Training librarians about the new technology*

Some librarians resist new technology (including broadband) because they do not feel comfortable with it. The RLCs provide ongoing training on how to use and understand new technologies.

### *Funding*

At the regional level, money came from multiple sources. Aggregation of demand led to lower overall costs. Funding came from member fees, E-rate discounts, and, in some cases, state support. In all cases, the RLC was able to put together a funding package that supported basic networking costs and staff, and occasionally the telecommunication costs as well. Most of the RLCs were involved in some aspect of helping their members apply for the E-rate program or the RLC applied as a consortium on behalf of its members. One RLC indicated the need for a good business plan that could bring together funding and how to use it effectively.

## CHALLENGES AND COPING STRATEGIES

The RLCs discussed at length the challenges they faced in the provision of broadband for the member libraries. Participants' concerns could be generally grouped into five areas, included among them strategies for coping with these challenges.

### *Keeping up with expanding bandwidth demands*

The participants agreed that the demand for more interactive web-based services such as gaming and downloading audio, video, and digitized content put stress on current bandwidth and, at peak use, "brought the system to a standstill." Different strategies were proposed by participants to address their broadband issues. These included:

- The use of packet shapers to better manage the use of bandwidth;
- The creation of virtual private networks or use of high priority-low latency to better allocate bandwidth between an ILS and the Internet;
- The addition of bandwidth capacity;
- The tracking and monitoring of network/bandwidth usage in order to have concrete data for planning bandwidth upgrades; and
- The segmentation of network traffic (e.g., wireless access from user laptops) to provide better quality of service.

The general consensus was that there are fewer solutions at higher bandwidth demand levels. It is important for critical functions to work and the system needs to be designed for peak service. As stated in a recent report by a participating RLC, "The cooperative needs a flexible industry-supported approach to separating the higher priority administrative traffic from lower priority traffic." One of the meeting attendees also said, "adequate bandwidth is not just important... It is essential if libraries are to maintain any credibility in today's and/or tomorrow's information world."

To begin this process, RLC staff that are hired for their technical expertise can evaluate the network infrastructure to determine bandwidth requirements for the member libraries.

### *Costs*

Cost of connection as well as the costs of underlying equipment (e.g., routers), additional training, upgrades, adding computers, and improving space were recognized as impediments.

RLC staff can negotiate with vendors for group contracts. In some cases, the RLCs take advantage of statewide contracts. Some other RLCs negotiate with local carriers to determine the best option for getting adequate bandwidth at the lowest cost. An RLC staff member at the meeting described how a local vendor discounted \$520,813 from an estimated \$548,224 for the last-mile fiber connection to upgrade a frame relay infrastructure to a fiber network. This extreme discount was a result of keen negotiations, compromising on vendor services, and aggregation of services. Presenting a regional business plan to vendors can be a powerful incentive in increasing interest and understanding of libraries' needs for increased infrastructure and bandwidth.

### *E-rate*

There was an agreement that E-rate issues need to be included in the list of challenges. These issues center on both the complexity of the application process and inadequate discounts.

Even with negotiated group prices, costs for increased connectivity can be prohibitive. It is important that libraries take advantage of the federal E-rate program and, in some states, state telecommunications discounts. As discussed previously, the RLCs can help members with the bureaucratic process by assisting member libraries with their applications or completing the application process on behalf of the members. One participant remarked that the RLC outsourced the application process for all its members. Even with the aforementioned local vendor discount for the last mile of fiber, the cost to the member libraries would have remained prohibitive without E-rate. For a library in this RLC, the connectivity charge was increased to \$18,552. With the E-rate and state discount, the increase was reduced to \$10,018, a savings of \$8,534 or 46%.

### *Keeping local staff trained*

Staff training presents a challenge for the RLCs, since technical knowledge in their member libraries is uneven. As one of the participants at the meeting said, "many libraries don't have basic tech expertise; this is a challenge in a big diverse network." Although the RLC staff is more technically proficient, there are not enough of them to provide the necessary support and training that member libraries might need.

### *Availability of bandwidth at certain locations*

Many RLCs provide service to libraries in remote locations, where wireless may be the only alternative for connectivity, even though it may not be the best connectivity option. The challenge here is one of staff expertise and ensuring that the RLC can meet the needs of librarians who have little or no training.



## SHARING KNOWLEDGE AND EXPERIENCE

If some RLCs play a key role in helping public libraries get and stay connected to high-speed broadband, then encouraging and assisting other RLCs to offer this service can benefit their library members, too.

While acknowledging that it would be more difficult for RLCs to commence this service now (one said this is “not an easy road to walk down”), the RLCs at the meeting suggested several possible ways of sharing their knowledge and experience. They agreed that, following the collaboration model, leadership and vision were vitally important.

### *Capacity planning*

One of the most intense discussions revolved around capacity planning. Three recent major reports – *Public Library Connectivity Project*, *Libraries Connect Communities*, and *Public Libraries and the Internet 2006: Study Results and Findings* – all recommended a minimum 1.5Mbps (e.g., T1) connection to every library. All of the RLCs agreed that any library with a connection less than this would soon have to upgrade to 1.5Mbps, but resisted declaring this a minimum.

There were two major concerns. One concern was that articulating a minimum of 1.5 Mbps (e.g., T1) would result in such a connection being considered sufficient, rather than evaluating the connectivity needs of the community. The group strongly recommended that OITP begin a discussion about capacity planning, based on the types of services offered by libraries that require broadband. In *Public Libraries and the Internet 2006*, Drs. John Bertot and Charles McClure describe a “Successfully Connected Public Library” that could be useful in determining capacity. The RLCs recommend looking at a tiered approach based on the number of computers and services offered.

The second major concern was that focusing on a T1 connection (or other connections at 1.5 Mbps) would take the emphasis off of fiber. All agreed that over the long term, fiber would be the ideal option for libraries because it allows for scalable growth, or growth as needed because of ownership of the fiber or long-term leases.

### *Consultants and mentors*

There was general agreement that RLCs newly providing this service would need assistance. State libraries, RLCs currently offering broadband service, and/or OITP could provide the necessary means for guidance, training, and best practices. One RLC had recently contracted an outside consultant to help restructure its network from a frame-relay network to a fiber network.

OITP has visited several states, both as part of the Public Library Connectivity Project and by invitation of the host state. These visits can be the catalyst for bringing together librarians, RLCs, the state library, telecom providers, and legislators. The group supported the continuation and expansion of this activity by OITP.

*Training for other RLCs*

The Collaboration Planning Process Model and the Toolkit could be combined with a training program for regional and local libraries to assist RLCs in planning and implementation. To be successful, this training should include a tool to estimate the total amount of bandwidth needed for an individual library, or a regional or state network. One suggestion was to present these workshops to a state or multi-state region that would encourage more people to attend, including RLC member libraries that might be interested in having their RLC provide broadband service.

*Ongoing communication*

One observation from the meeting was that RLCs that do provide broadband service do not have much opportunity to share information and ideas. Many expressed the desire to continue communication through a wiki, ALA Member Interest Group, or other means to be determined, in order to continue the conversations and to share techniques, plans, and problems.

*Continue advocacy for E-rate reform*

OITP has taken the lead in the library community for advising the Federal Communications Commission (FCC) and the administrative entity that oversees the federal E-rate program, advocating for reform in this program to better meet the needs of libraries. The RLCs acknowledged the importance of this activity and praised the ALA Washington Office for its proactive efforts to reform E-rate to benefit more libraries.

*Conclusion*

The RLCs were asked to share the lessons they had learned that should be shared.

1. Hire good people.
2. Remember that planning is a continuous process.
3. Good faith and trust are the keys to successful collaboration.
4. Determine what is beneficial to the smallest and largest libraries.
5. Find a funding model that works.

**OITP is committed to assisting public libraries increase their broadband capacity to better meet the needs of their users. OITP will continue to work with Regional Library Cooperatives and State Libraries to bring this about. The RLC conference provided valuable input and concrete suggestions for future work. The specific ideas include:**

1. Organize and hold a workshop on capacity planning.
2. Develop mechanisms for the Denver participants to communicate and cooperate in order to support the emergence of a community of regional library cooperatives that support broadband deployment.
3. Continue to formalize knowledge about the RLCs and their successes and challenges with broadband deployment for the purpose of sharing this knowledge with the larger RLC community.

## APPENDIX

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## NOTES

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